

Written evidence submitted by the British Pharmacological Society to the Government's UK Research and Development (R&D) Roadmap consultation

This response was also submitted via the consultation online portal

About us

The British Pharmacological Society (BPS) is the primary UK learned society concerned with research into drugs and the way they work. The Society has around 4,000 members working in academia, industry, regulatory agencies and the health services, and many are medically qualified. The Society covers the whole spectrum of pharmacology, including laboratory, clinical, and toxicological aspects. Pharmacology is a key knowledge and skills base for developments in the pharmaceutical and biotech industries, and is therefore fundamental to a thriving UK industry and R&D. These skills allow members of the Society to identify therapeutic areas of clinical need, develop novel treatments that target these areas and ensure these new treatments are incorporated into healthcare practice bringing benefit to patients. The Society publishes three scientific journals: the British Journal of Pharmacology, the British Journal of Clinical Pharmacology, and Pharmacology Research and Perspectives.

Questions

1. How can we best increase knowledge and understanding through research, including by achieving bigger breakthroughs?

Our response to this question makes three key points:

- Uphold commitments to investing in UK R&D
- Invest in research in the NHS, and collaboration between the NHS and life sciences
- Ensure controlled drugs legislation is not a barrier to legitimate research

1.1 The UK demonstrated its strengths in life sciences through its rapid response to COVID-19 (e.g. clinical trial platforms, funding calls, safely expedited trials), further supporting continued investment in UK R&D as set out by the Roadmap. COVID-19 has also had a significant impact on UK medical research charities¹ and, considering their contribution to the UK research base, funding options to protect these organisations should be explored.

1.2 Collaboration is a feature of successful research – the Government must support the sector with access to collaborations, funding, and skilled people. This should be a particular priority in defining the future relationship with the EU; the Society is a signatory to a joint statement coordinated by Wellcome calling for close UK association with Horizon Europe².

1.3 Bridging the 'translational gap' is a priority in the Life Sciences Industrial Strategy³. Challenges at the preclinical-clinical interface are complex, and cultural in addition to structural. There should be support for investment in high priority skills areas (including clinical pharmacology) and a strategy to embed research into care within the NHS⁴. The NHS People Plan 2020-21⁵ highlights the contribution made by NHS people to research regarding COVID-19; future iterations should deepen commitments, including supporting the workforce to be 'research ready' and 'research active'. Research-active hospitals deliver better care and have better patient outcomes, with benefits not limited to those who participate in research^{6,7,8,9,10}. There is an opportunity to align UK life sciences with the aims of the NHS Long-Term Plan for the benefit of patients and the UK economy. A joint NHS-

Life Sciences Steering Group would support and encourage connectivity across academia, industry and the NHS.

- 1.4 The current regulatory system for controlled substances (specifically, Schedule 1) is a barrier to legitimate scientific research. We strongly support a review of the Misuse of Drugs Act (1971) and associated regulations. The intention should be to ensure that the regulatory system fully supports legitimate research and the development of new therapeutics. The Society has been working with partners in the research community to draw attention to these issues for a number of years. Specifically, compounds in Schedule 1 may be used for research only under a Home Office licence, but this barrier imposes financial and logistic restrictions, thereby preventing researchers from studying these drugs. Members of the Society tell us this is because the process is hard to navigate, puts an unrealistic burden on individual researchers, is not cost-effective and takes too long to organise. The assessment of harms should be part of setting standards of safe use in research environments, but a modern regulatory environment must not get in the way of legitimate research. Schedule 2 provides a working model, in that it allows research to be conducted in recognised institutions, while still mitigating against harms. We propose extending the recognition of 'medicinal value' to explicitly include 'research value', noting that it is difficult to establish medicinal value in the absence of fundamental research. We would also like to recommend that decisions are reviewed on a regular basis to take evolving contemporary scientific evidence into account. Such a review will also need to consider the UK's international obligations under the United Nations Conventions, making clear recommendations about where independence is possible and where further negotiation is needed.
- 1.5 Drug policy is also an issue of health inequality. There is an opportunity for the UK to show leadership through enhanced engagement with international drug policy. For example, a recent report by the Global Commission on Drugs¹¹ noted that poor policy and dysregulated markets has led to 75% of the world population having no access to pain-relieving drugs. The UK should play its part in calling for a critical review of the current models of classification of drugs, aligning policy in relevant areas.

4. How can we attract, retain and develop talented and diverse people to R&D roles? How can we make R&D for everyone?

- 4.1 Everyone should have equal opportunities and access to a successful career within Science or Health, its research, and its outcomes¹². Barriers to inclusion must be removed and there must be a focus on a positive experience that supports the needs and identity of the individual and teams, as well as sector needs. The Society supports a model that considers the three types of diversity (demographic, experiential, cognitive) to describe identity¹³.
- 4.2 UKRI, Wellcome, the Academy of Medical Sciences and others have undertaken extensive work on equality, diversity and inclusion, including developing the concepts of team science and research culture. Some people may not see a career in research as being 'for them'. As such, there needs to be a cross-sector approach to broadening awareness of the diversity of careers available, including raising visibility of the full range of people and teams who work in R&D. Some may not have 'science capital'¹⁴. For this reason, opportunities to undertake paid internships and to build networks are needed. Some may not feel able to stay, or that their

contributions are recognised. Therefore, a commitment to positive research culture, flexible career pathways and incentives that reward all contributions to successful research must be a priority. Further, broadening the pool of NHS research-active staff would improve career satisfaction for healthcare professionals and help reach a wider range of patients, for example through primary care¹⁵.

- 4.3 There should also be a focus on training. The Society, with partners in the Clinical Pharmacology Skills Alliance and a cross-sector Trailblazer Group is working to develop a new, level 7 Clinical Pharmacology Scientist apprenticeship¹⁶ that will provide recognised training and a career pathway for skills critical to UK R&D. We support the investment in apprenticeships, noting that there is still work to be done to connect apprenticeship pathways with academic routes and to help people and employers navigate them fluidly. The government, in collaboration with the Institute for Apprenticeships and Technical Education, should review implementation of the apprenticeships scheme, particularly in relation to the life sciences and the NHS. This should build on the findings of the Sainsbury review¹⁷ and examine how higher-level apprenticeships integrate with the academic pathways that are more familiar to this sector.
- 4.4 Making R&D for everyone is not limited to the experience of the workforce; everyone should have the opportunity to benefit from the outcomes of research. This means a focus on research that is inclusive by design at all stages, and a focus on public and patient involvement when it comes to under-represented groups and under-studied diseases¹⁸. For example, if sex is not actively built into research as a study design variable, the scientific and clinical picture will continue to be biased towards males¹⁹. Examples of addressing this include the British Journal of Pharmacology setting expectations that sex should be considered an experimental variable in all studies submitted for publication²⁰ and the Gendered Innovations Project²¹, which aims to support researchers and funders to integrate sex and gender analysis into research. This is only one aspect of addressing diversity in research, but it provides a helpful illustration. A framework considering the diversity implications of research design and delivery should be developed to span the full R&D pathway.

5. How should we ensure that R&D plays its fullest role in levelling up all over the UK?

- 5.1 The Society supported research into the contribution of academic research to drug discovery across the UK. The research [unpublished, but available on request] used a systematic literature review methodology to extract 268 case studies from the 2014 Research Excellence Framework (REF2014) that claimed impact in the context of 'drug discovery and development'. These case studies capture impact between January 1993 and December 2013. The key findings are:
- Academic research generates impact in drug discovery by developing new drugs and new technologies that enhance the R&D process.
 - Academic research produces resilient spin-out companies, likely to be of growing commercial value to the UK
 - UK-based academics often hold key leadership and consensus-building roles within clinical trials, organisations and networks, shaping the future of the sector.
 - Academic capability for impact in drug discovery and development is widespread across the UK, with impact being claimed by 65 different

institutions across 268 impact case studies submitted to REF2014 – it is not solely focused in 'the golden triangle'.

5.2 The research also considered the conditions through which impact arose. In summary:

- Around one third of impacts grew from 'blue skies' fundamental research.
- Impacts arose from interdisciplinarity, cross-sectoral collaboration and a diverse funding ecosystem.
- Private investment from multinational companies was leveraged by academia based on knowledge, expertise, relationships and appropriability conditions, and is *not* limited to geographical proximity of firms and universities.

5.3 Academic researchers have a dual role, generating the fundamental knowledge that can drive impact and acting as innovators in their own right. To support success, we would like to highlight the importance of maintaining a diverse, mixed-model funding landscape. This can be done both in terms of directly investing in a balance of fundamental, commercially-relevant and mission-driven research, and by promoting UK academic research with the aim of attracting inward investment, both nationally and internationally. Further, funding models should seek to embed collaboration and interdisciplinarity. Funding decisions should also be made in the context of building a positive research culture that supports realisation of research outcomes in the long-term (aligned to local and global missions/challenges), instead of incentivising short-term metrics that focus on scientific visibility e.g. 'first author papers'.

5.4 UK academia is an important contributor to innovation and impact in drug discovery and development, which is an area of strategic importance for the UK. Investing in academic research has the potential to maintain and develop the environment to attract talented researchers and leverage investment from a range of sources, both national and international. Investment into academia from EU sources played a significant role in the generation of impact; maintaining close alignment with the EU framework programme Horizon Europe should be a priority. However, the findings also suggest that it is the strength of the UK research base, strong relationships and ease of collaboration that helps attract inward investment – not geography. Future funding frameworks should recognise the power of UK academic research to attract inward investment, and actively showcase it to potential international partners.

7. How should we most effectively and safely collaborate with partners and networks around the globe?

7.1 Please see our response to Q5. Academic research is an important contributor to UK R&D. This includes being a source of inward investment. Efforts to matchmake UK academics with global investors and companies are likely to help catalyse such relationships. Similarly, learned societies such as the Society have global networks with individuals spanning industry as well as academia. Making best use of these networks can support the sharing of messages and priorities directly with researchers.

8. How can we harness excitement about this vision, listen to a wider range of voices to ensure R&D is delivering for society, and inspire a whole new generation of scientists, researchers, technicians, engineers, and innovators?

8.1 In terms of ensuring R&D is delivering for society, we refer to the research noted in our response to Q5. The research considered how UK academic impact contributed

to the World Health Organisation's (WHO) sustainable development goals (SDGs)⁸. It concluded that there appears to be directionality issues: priority setting may not reflect the greatest societal needs. Non-communicable diseases, in particular neoplasms (a characteristic of cancer), were the focus of greatest impact, while infectious diseases, mental health and reproductive health, appear underrepresented. Just 15 case studies (6%) describe work targeting orphan diseases (rare diseases affecting small populations).

- 8.2 We welcome the commitment to deliver moonshots, which should build on the 'grand challenges' and address inequality. UK alignment with global missions where appropriate would broaden the pool of those benefiting from UK research. A commitment to removing barriers to interdisciplinary collaboration across the spectrum of R&D will likely help achieve these goals and realise unexpected spillover benefits. There should be a focus on integrating the social sciences, the role of social interventions and the experience of the patient and/or end user.
- 8.3 In terms of listening to a wider range of individuals, early-career voices can offer perspective and improve research culture. The Society has an elected early career member on the Society's Council, as well as a dedicated early-career advisory group²². These initiatives actively engage early career members in decision-making, and we advocate for this approach.
- 8.4 Improving patient involvement in research should also be a priority. Part of this should include improving the diversity of researched populations. Research should be informed by clinical experience, and initiatives such as the James Lind Alliance²³ should continue to be supported and made more visible to a wider range of researchers.
- 8.5 Improving accessibility of research to a range of audiences is also important. There must be incentives for researchers to share their work more widely. This should not just be through open access publications, but also through incentives to undertake meaningful public and/or patient involvement.
- 8.6 There should also be support and training to encourage scientists to undertake activity to communicate with the public. For example, the Science Media Centre offers 'Introduction to the News Media'²⁴ training, this teaches early-career researchers about the importance of engaging with the media, something demonstrated during the COVID-19 pandemic. Aligning with this, Sense about Science offer workshops²⁵ to train this next generation of researchers in the importance of engaging with policy makers, the media and the public. Backing for initiatives such as these could help to develop and support a future generation of scientists and researchers who are confident and skilled in engaging wider audiences throughout the scientific process, creating a lasting legacy.

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